

Read pages 10-12 in your text and review your notes. Then, answer the following questions to practice what we have discussed.

1. Classify each of the following statements as either empirical knowledge (E) or theoretical knowledge (T)
 - a. A yellow solid forms when two solutions are mixed _____
 - b. When 3 g of calcium chloride are added to water, the temperature of the water rises by 5°C _____
 - c. For a chemical reaction to occur, molecules must bump into each other under certain conditions. _____
 - d. Chemical reactions occur faster at higher temperatures because molecules have more kinetic energy; the molecules move faster and collide harder. _____
 - e. Ice melts at 0°C. _____
 - f. Atoms rearrange themselves during a chemical reaction in order to form new products. _____
2. For each of the sentences given below, indicate whether the sentence is an observation or an inference.
 - a. The wood does not burn because it is wet
 - b. The boiling point of methanol is 67.5°C
 - c. There is 125 mL of water in the flask.
3. Qualitative analysis involves making qualitative observations and then interpreting the results to identify a substance. Is qualitative analysis empirical or theoretical? Explain.
4. For each of the statements below, write a statement of observation and one of inference. For example:
A forensic investigator probes the possibility of arson at a burned building.
OBSERVATION: The building is charred and there are ashes around.
INFERENCE: It is possible that the fire was caused by an arsonist.
 - a. A cashier is short of funds at the end of her shift.
 - b. James received a high grade on the last unit test
 - c. The victim described the food as round, flat, and covered in sauce.
 - d. The landlord was upset; the room was carpet was covered in fur.